PHY101 HW #3
Due Friday, 1/25/13 @ 5pm
Cauchy's integral formula and Laurent series

Reading

Read Section 4 of Chapter 14 of Boas. Although there are problems below from later sections, they are solved using the techniques of sections 3 and 4.

Problems

Our focus this week will be on Cauchy's Theorem, Cauchy's Integral Formula, and their consequences. These fundamental results will be essential for later applications, where we will use them to solve sums, integrals, and differential equations. You'll start to see that certain integrals which look difficult and which require pages of algebra to solve without complex analysis, have simple, elegant solutions using complex analysis.

From Boas Chapter 14:

Section 3, page 676, Problems 17, 22. Problem 22 uses the formulas given in problem 21. (I did not assign problem 21, but I hope that it is nevertheless clear to you how this formulas are obtained. If not, ask!)

Section 4, page 681, Problems 5, 10

Section 5, page 683, Problem 1 (Note: This problem does not actually use material from section 5 and so can be done before we cover the residue theorem.)

Section 6, page 686, Problems 3, 7. These are just more problems involving Laurent series. You don't actually need to read section 6 to work them (though reading ahead is always good), and the fact that we have not yet covered section 6 in class will not be a problem.

Section 11, page 718, Problems 2,3, 36, 37. Problem 2 is actually more practice with material from last week.